

REMARKS/ARGUMENTS

Claims 23-44 are active in the case. Reconsideration is respectfully requested.

The present invention relates to radiation curable compounds having capped amino groups.

Claim Rejection, 35 USC 103

Claims 23-25, 27-41 and 44 stand rejected based on 35 USC 103(b) as obvious over Kuroda et al, EP 0,965,604 in view of Bradford et al, U. S. Patent Publication 2003/0083397 and Hirata et al, EP 566,037. This ground of rejection is respectfully traversed.

The Examiner states in his comments regarding Kuroda et al, '604 that the reference discloses *the reaction product of (A) allophanate modified polyisocyanate, (B) hydroxylalkyl (meth)acrylate, (C) an N- hydroxylalkyl-oxazolidine and a dibutyltin dilaurate catalyst.*

Applicants submit that this statement is incorrect. In the first place it is not evident where the reference actually discloses an allophanate group containing isocyanate. Secondly, the Examiner appears to speak in terms of an allophanate compound (reactant (A)) that is actually obtained from an independent source and is used as a reaction component along with a hydroxyl group containing compound and a capping agent. However, this reaction is not what the reference teaches and certainly is not the claimed product polyurethane produced by the present process where at least one diisocyanate or polyisocyanate is reacted with at least one compound containing an isocyanate reactive group and at least one compound containing an isocyanate reactive group and at least one capped amino group, with the reaction occurring under conditions which forms a product which contains a significant allophanate component. For such a product to be obtained, the catalyst that is selected is the type which produces allophanate group containing polyurethane such as the quaternary ammonium hydroxides disclosed on page 23, lines 8-16 of the present specification. On the other hand, as for the

reference, Example 1, describes the reaction in which three alcohols including primarily polyoxypropylenediol are reacted with diphenylmethane diisocyanate in the presence of dibutyltin dilaurate catalyst and a capping agent. This reaction does not produce a polyurethane product that contains allophanate groups, as previously stated on this record, but instead results in what is said to be a urethane prepolymer which contains urethane linkages.

The Bradford et al patent publication discloses what is termed a dual cure coating composition comprised of a radiation curable component (a1), a thermally curable binder component (a2) and a thermally curable crosslinking component (a3). This latter component preferably is a polyisocyanate ([0064] to [0067]). The publication in paragraph [0067] discloses that a possible type of polyisocyanate that may be used is an isocyanate that contains allophanate groups, if for some reason this material is selected over isocyanate compounds containing a variety of groups such as isocyanaurate, biuret, urethane, urea, carbodimide and uretidione groups. However, there is no teaching or suggestion as to how such an allophanate is prepared. In fact, the simple mention of an allophanate appears to indicate nothing more than that the allophanate material is an “off-the-shelf” item. There is certainly no disclosure of a reaction of a di- or polyisocyanate with a hydroxyl group containing compound and a capping agent in the presence of a specific type of catalyst that will result in a polyurethane that contains allophanate linking groups.

The Examiner appears to state at paragraph 4 of the Office Action that the dual cure coating composition of the reference is a suggestion of the present process. However, this is incorrect. The reference does not relate to or teach a process of producing an allophanate group containing polyurethane, but rather teaches a basic mixture of a radiation curable component (a1), a thermally curable binder component (a2) and a thermally curable crosslinking component (a3) along with other mixture components such as including pigments, fillers, reactive solvents and photoinitiators. The product mixture is applied by

spraying to a surface and then thermally and by radiation cured to form a surface covering.

This is not the present invention.

Of the three references that have been cited Hirata et al '037 discloses the preparation of a polyisocyanate material that contains both allophanate and isocyanurate structures. In a quite specific reaction an aliphatic polyisocyanate compound and a monohydric alcohol in the presence of a specific catalyst as described in the paragraph bridging pages 4 and 5 of the reference. It is the use of the type of catalyst described that produces the polyisocyanate product that contains allophanate and isocyanurate structures. These catalysts do not include the dibutyltin dilaurate catalyst essentially exclusively used in the reaction system described in Kuroda et al. However, it is clear from this description that the process described in Hirata et al is not that of the present invention which requires, in the presence of an allophanate group promoting catalyst, the reaction of a di- or polyisocyanate with at least one compound containing an isocyanate reactive group and at least one compound containing an isocyanate reactive group and at least one capped amino group. The preferred aliphatic monoalcohol reactant of Hirata et al is not a reactant (b) of the present claims, although the reference does disclose a monoalcohol that contains a polar group such as an unsaturated bond. Of course, the required reactant (c) of the present process is not taught by Hirata et al. Clearly, the combined references do not suggest the present process as claimed.

Claims 23-25, 27-44 stand rejected based on 35 USC 103(b) as obvious over Kuroda et al, EP 0,965,604 in view of Bradford et al, U. S. Patent Publication 2003/0083397 and Hirata et al, EP 566,037 and further in view of Leitner et al, '655. This ground of rejection is respectfully traversed.

As to the combination of the Kuroda et al, Bradford et al and Hirata et al, applicants have previously provided their comments as to the reasons why the present invention is distinct from the disclosures of these three references. The three references in combination do

not suggest the formation of a polyurethane which contains allophanate groups in the manner in which the specified reactants are brought together.

The Leitner et al patent discloses the preparation of water dilutable binders by reacting a hydrocarbyl diisocyanate with a hydroxyalkyloxazolidine to form a monoadduct of the oxazolidine capping agent and the diisocyanate. The adduct is reacted either with a hydroxyl functional polycondensation resin or a polymerization resin or a polyaddition resin to provide a binder that is water soluble upon partial or total neutralization of the basic groups in the binder. The reaction and product described in Leitner et al clearly have nothing to do with the present invention. Accordingly, the outstanding ground of rejection is believed overcome and withdrawal of the same is respectfully requested.

Claim 26 stands rejected based on 35 USC 103(a) as obvious over Kuroda et al, EP 0,965,604 in view of Bradford et al, U. S. Patent Publication 2003/0083397 and Hirata et al, EP 566,037 and further in view of Bruchmann et al, '569. This ground of rejection is respectfully traversed.

Again, the combination of the Kuroda et al, Bradford et al and Hirata et al, does not suggest the invention as claimed for the reasons previously stated. The fact is that the references do not suggest a polyurethane product in which the at least three components of at least one diisocyanate or polyisocyanate is reacted with at least one compound containing an isocyanate reactive group and at least one compound containing an isocyanate reactive group and at least one capped amino group, with the reaction occurring under conditions which form a product which has a significant allophanate content. Bruchmann et al does not improve upon these combined disclosures because it only discloses a one or two component polyurethane material which is formed by the reaction of a reactive compound (A) that contains an isocyanate group, a urethane, a thiourethane or urea group and two capped isocyanate-reactive groups with a polyisocyanate. There is no teaching or suggestion of

forming a polyurethane that contains allophanate groups. No catalyst is disclosed that would form these groups. Reference is briefly made to dibutyltin dilaurate as a catalyst, but this is not made in the context of forming an allophanate group containing urethane product. In fact, it is well known that the use of this particular catalyst results in the formation of a polyurethane with no allophanate groups. Accordingly, the combined disclosures do not suggest the embodiment of Claim 26 and withdrawal of the rejection is respectfully requested.

It is believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

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